Mass General Brigham

Racial Disparities as a Cause of Severe Asthma: Emerging Approaches in Management

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Disclosures

Financial: RubiconMD consultant, Sanofi Advisory Board

Identities:

- Black woman
- Daughter of Haitian immigrants
- Wife of a Black man
- Mother to 2 Black sons
- Only one of my siblings to have Bachelor's degree
- First physician in the family

Outline

- Review current state of racial disparities in asthma
- Understand the role of structural racism in asthma
- Discuss emerging interventions and methods in asthma racial disparities
  - Addressing social determinants of health & pharmacoequity

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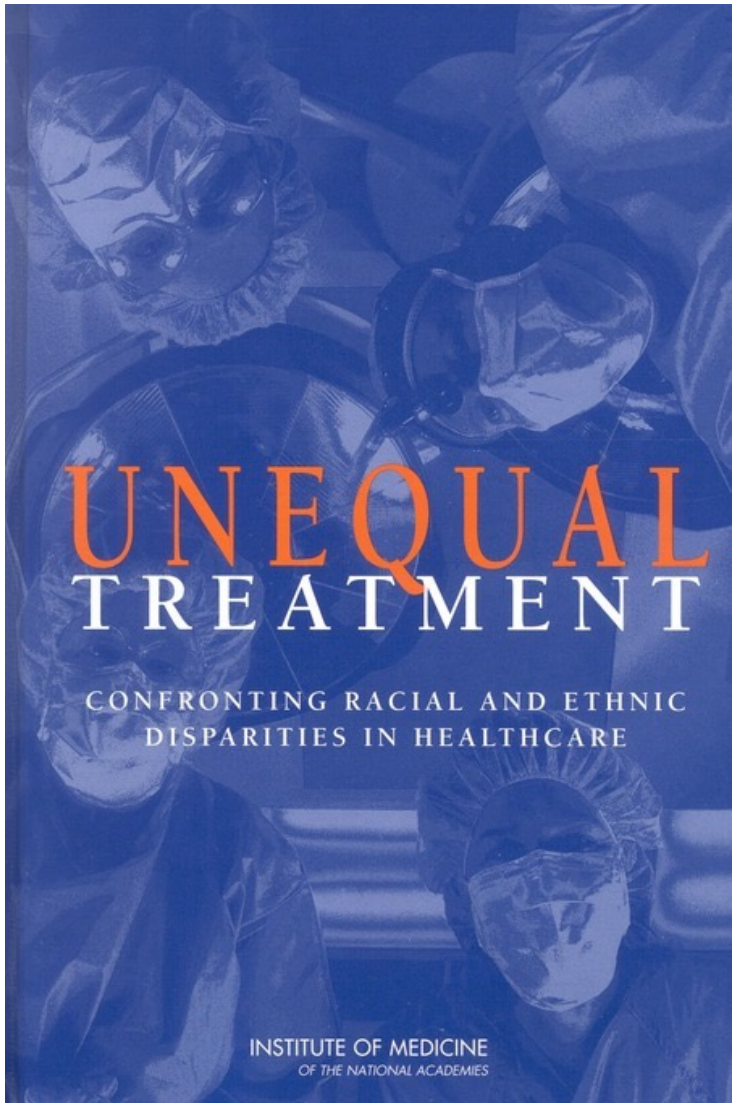
Definition of Health Disparities

- *"…* a particular type of (**preventable**) health difference that is closely linked with economic, social, or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater social or economic obstacles to health based on their racial or ethnic group.*"* (Healthy People 2020)
- e.g Infants and toddlers more likely to get ear infections compared to adults
- e.g. Black and Latinx children with frequent ear infections are less likely to receive tympanostomy tubes compared to White children

Simon, A et al (2017). *Academic pediatrics.*
https://www.nidcd.nih.gov/health/ear-infections-children#5

Definition of Health Disparities

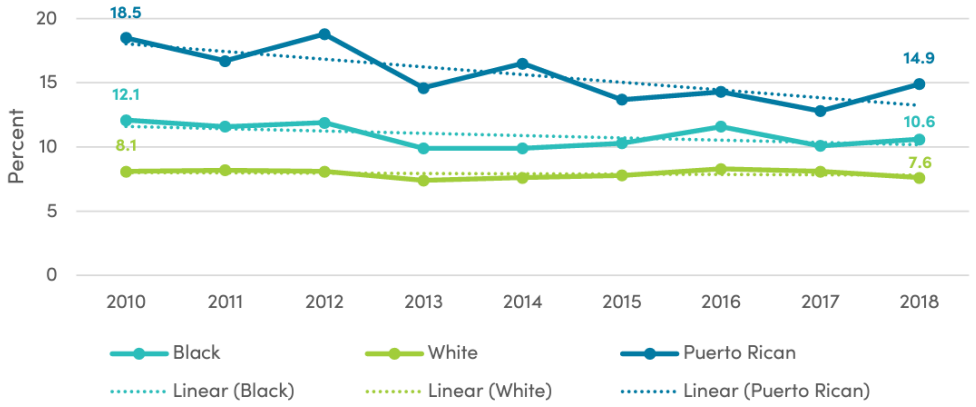
- Health disparities by race/ethnicity is consistent across **ALL** conditions & health services
- Disparities are associated with SES & reduce when SES is controlled
- **Studies show racial disparities persist despite adjusting for SES & healthcare access**



Institute of Medicine (US) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. Unequal Treatment 2003
https://altarum.org/RacialEquity2018

Asthma has a higher prevalence, morbidity, & mortality in Black and Latinx communities compared to other racial groups

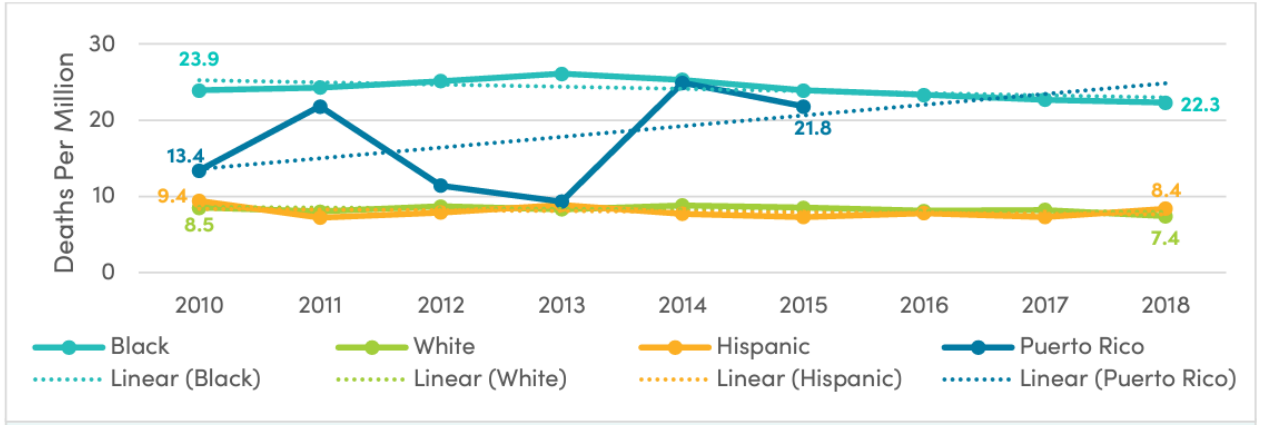
Current Asthma Prevalence by Race and Ethnicity



Source: CDC, National Center for Health Statistics, National Health Interview Survey (2010-2018)

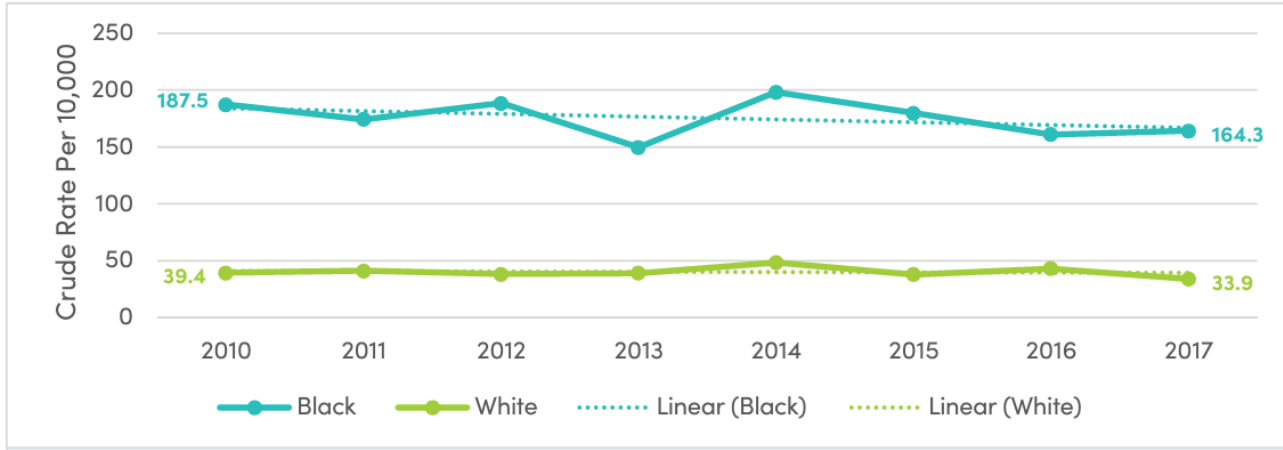
Prevalence estimates for Black and white race do not include people of Hispanic ethnicity. Puerto Rican ethnicity is captured as a subset of Hispanic ethnicity in the NHIS.

Asthma-Related Deaths by Race, Ethnicity and Residents of the Commonwealth of Puerto Rico



Source (U.S): CDC, National Center for Health Statistics, National Vital Statistics System: Mortality (2010-2018)
Source (PR): Puerto Rico Department of Health, Technical report, Puerto Rico Asthma Project (2010-2015)

Asthma-Related ED Visits by Race



Source: CDC, National Center for Health Statistics, National Ambulatory Medical Care Survey (2010-2017)

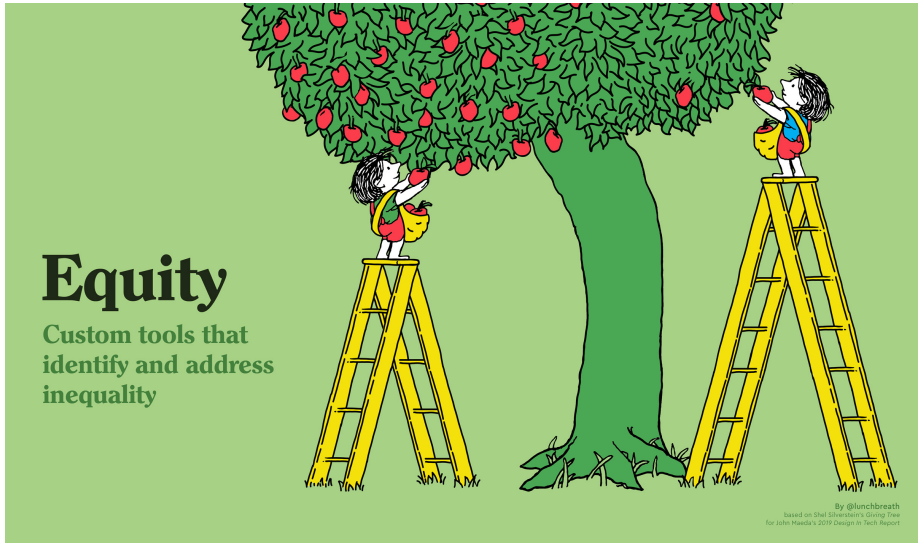
AAAAI Work Group Report

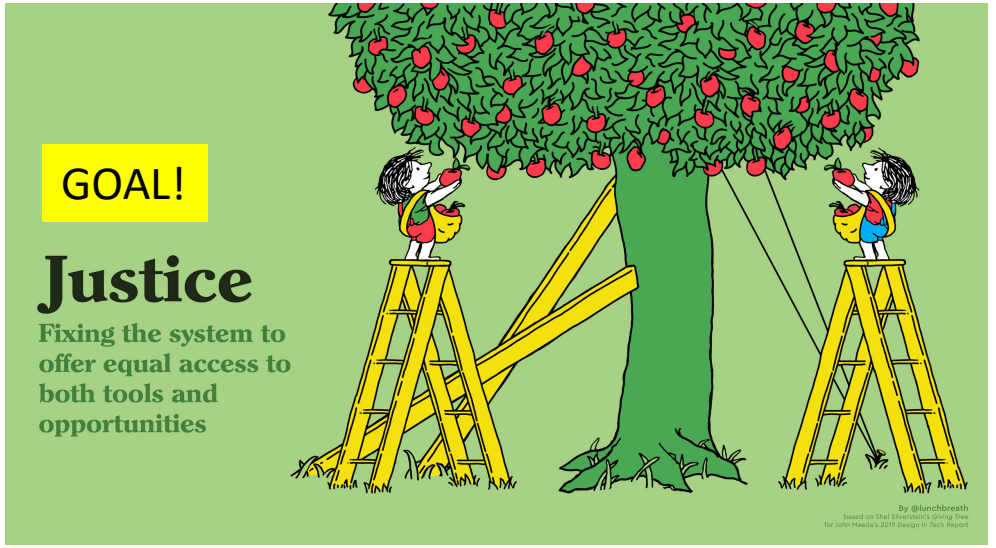
American Academy of Allergy Asthma & Immunology

Health disparities in allergic and immunologic conditions in racial and ethnic underserved populations: A Work Group Report of the AAAAI Committee on the Underserved

Carla M. Davis, MD, FAAAAI,[a,b] Andrea J. Apter, MD, MA, MSc, FAAAAI,[c] Adrian Casillas, MD, FAAAAI,[d] Michael B. Foggs, MD, FAAAAI,[e] Margee Louisias, MD,[f] Elsie C. Morris, MD,[g] Anil Nanda, MD, FAAAAI,[h,i,j] Michael R. Nelson, MD, PhD, FAAAAI,[k] Princess U. Ogbogu, MD, FAAAAI,[l] Cheryl Lynn Walker-McGill, MD, MBA, FAAAAI,[m,n] Julie Wang, MD, FAAAAI,[o] and Tamara T. Perry, MD[p,q]

Let's Be on the Same Page





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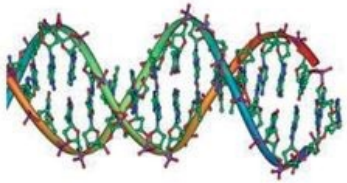
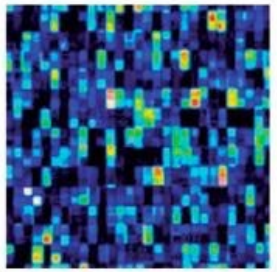
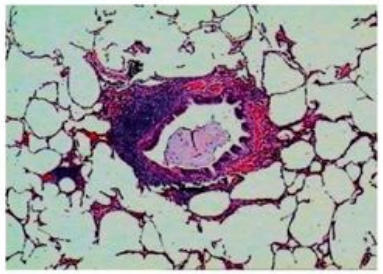






Genes | Gene expression | Airway histology | Lung Function | The patient

Severe asthma phenotyping			
Genetics Epigenetics Transcriptome Proteome Metabolome	Microbiome Immunity Inflammation	Remodeling Bronchial hyperresponsiveness Obstruction	Symptoms Comorbidity Quality of life

Chung et al, ETS/ATS guidelines severe asthma ERJ 2014

Place Matters in Health & Life Outcomes

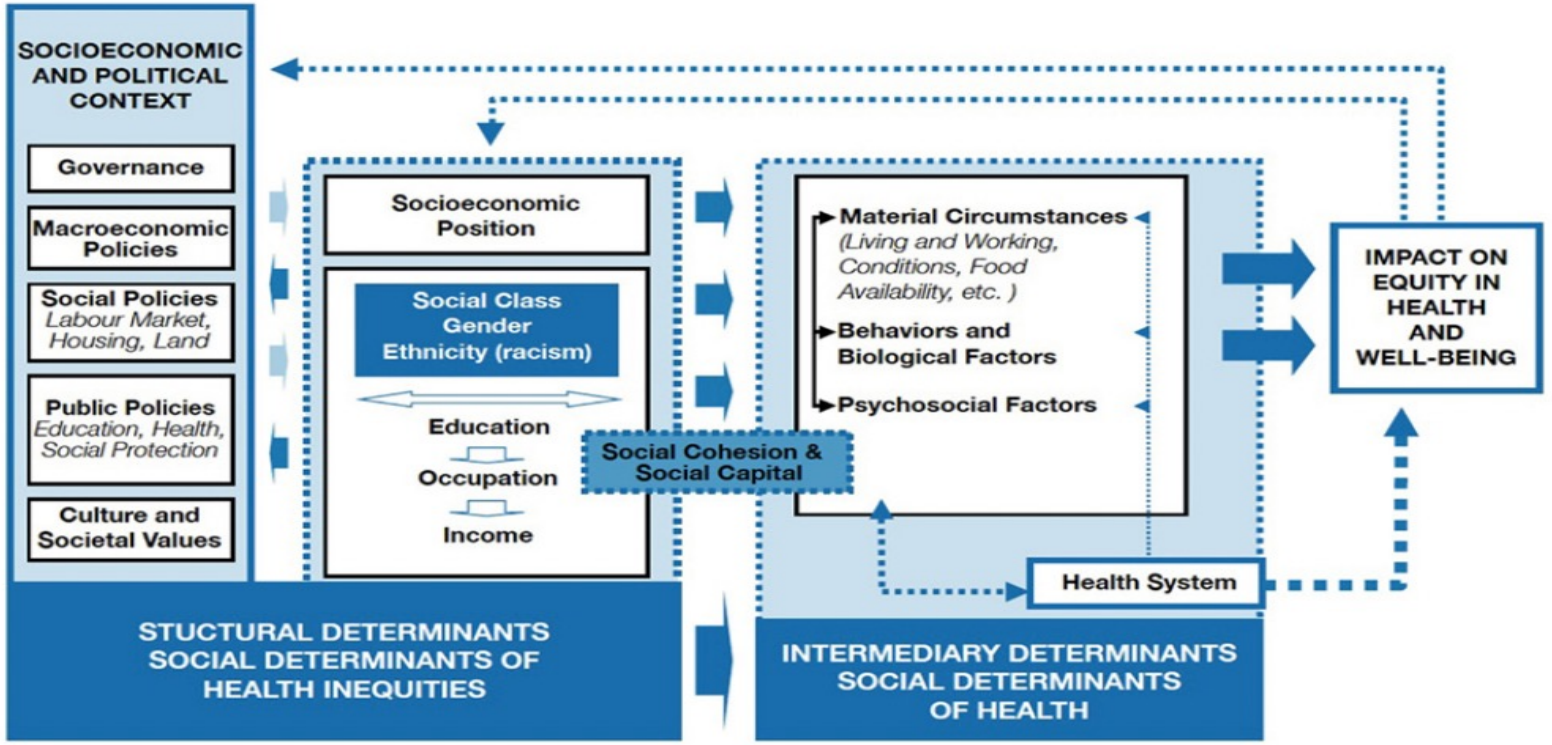
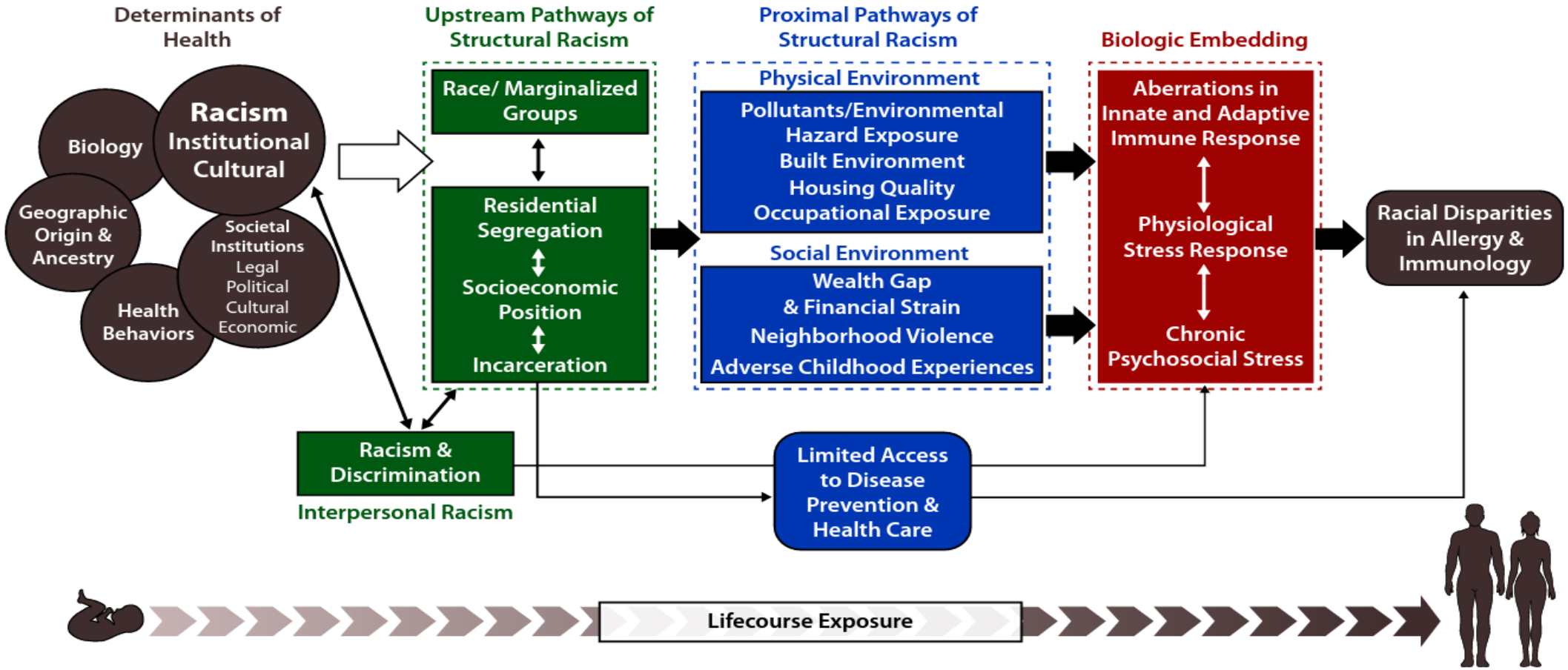


FIGURE 3-3 World Health Organization (WHO) conceptual framework.
SOURCE: Solar and Irwin, 2010. Reprinted with permission from the World Health Organization.

Structural Racism Shapes Social Determinants of Health



Martinez, de la Rosa, Mujahid, Thakur JACI 2021

Systemic Racism Modulate Immune Function

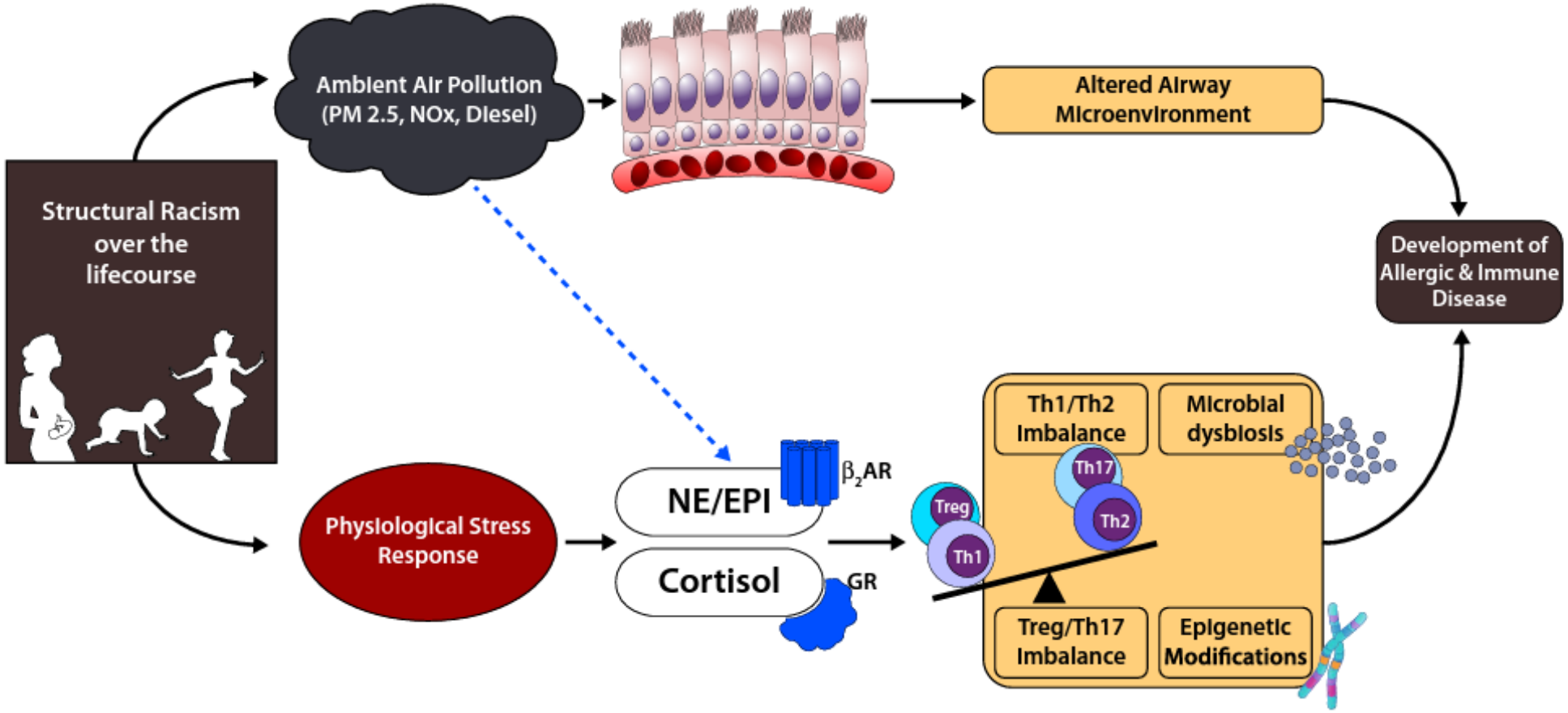


FIG 2. Empiric pathways for biologic embedding of structural racism. Structural racism may modulate immune function and promote atopic diseases through the following mechanisms: (1) T_H1 cell–T_H2 cell polarization, (2) T_H17 cell–Treg cell balance, (3) the microbiome, and (4) epigenetic modifications

Martinez, de la Rosa, Mujahid, Thakur JACI 2021

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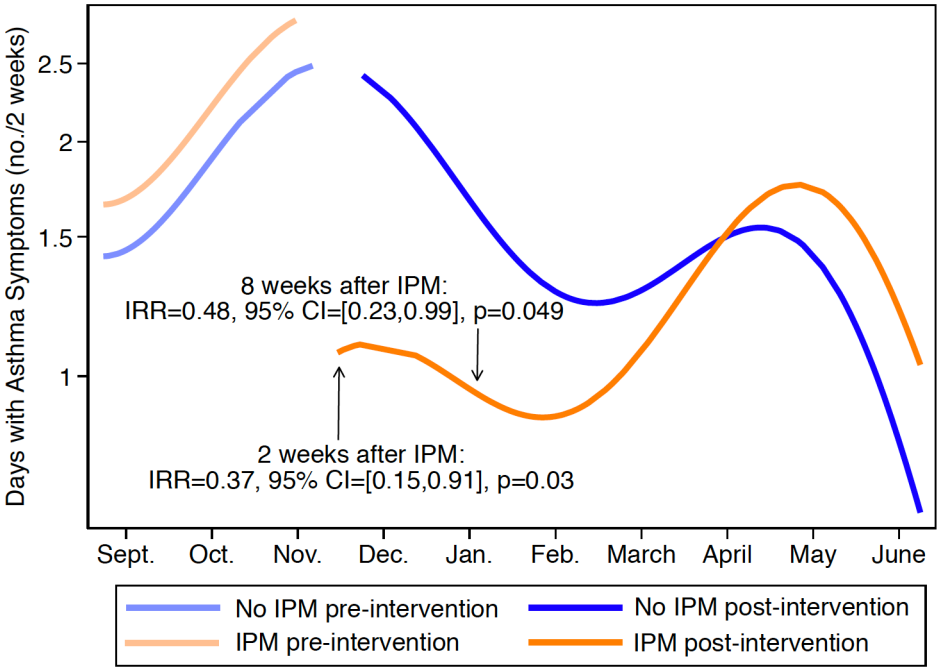
JAMA | Original Investigation

Effect of School Integrated Pest Management or Classroom Air Filter Purifiers on Asthma Symptoms in Students With Active Asthma

Sept 2021

Wanda Phipatanakul, MD, MS; Petros Koutrakis, PhD; Brent A. Coull, MD, PhD; Carter R. Petty, MA; Jonathan M. Gaffin, MD, MMSc; William J. Sheehan, MD; Peggy S. Lai, MD, MPH; Lisa M. Bartnikas, MD; Choong-Min Kang, PhD; Jack M. Wolfson, PhD; Mihail Samnaliev, PhD; Amparito Cunningham, MD, MPH; Sachin N. Baxi, MD; Perdita Permaul, MD; Marissa Hauptman, MD, MPH; Michelle Trivedi, MD, MPH; Margee Louisias, MD, MPH; Liming Liang, PhD; Peter S. Thorne, PhD, MS; Nervana Metwali, PhD; Gary Adamkiewicz, PhD, MPH; Elliot Israel, MD; Andrea A. Baccarelli, MD, ScD; Diane R. Gold, MD, MPH; for the School Inner-City Asthma Intervention study team

- SICAS-2: Factorial design randomized trial of school-wide IPM and classroom-based HEPA filtration purifiers
- 41 urban schools, 236 children (6-10 y/o) with active asthma (57% Latinx, 24% Black)
- Overall, interventions did not reduce asthma symptom days (1º outcome) but did reduce missed school days (2º outcome)
  - It did reduce mouse allergen levels (?maybe not enough)
  - **63% reduction in asthma symptoms was seen mid-November and February in the IPM group**
- **Additional booster IPM led to more sustained effects?**



JAMA | Original Investigation

Association of a Housing Mobility Program With Childhood Asthma Symptoms and Exacerbations

May 2023

Craig Evan Pollack, MD, MHS; Laken C. Roberts, PhD, MPH; Roger D. Peng, PhD; Pete Cimbolic, BA; David Judy, BA; Susan Balcer-Whaley, MPH; Torie Grant, MD, MHS; Ana Rule, PhD; Stefanie Deluca, PhD; Meghan F. Davis, PhD; Rosalind J. Wright, MD; Corinne A. Keet, MD, PhD; Elizabeth C. Matsui, MD, MHS

- Mobility Asthma Project (MAP): prospective cohort
- 123 children (5- 17 y/o) with persistent asthma (or recent flare) enrolled into the Baltimore Regional Housing Program (BHRP) [98% Black]
- Housing vouchers to move into more resourced neighborhoods
- No comparison group, compared to URECA outcome data
- Study Visits: Baseline, q3 month phone call, q6mo home visit
  - Follow-up 12 months after move
  - Home environmental exposures collected before and after moves

Moving to Higher Resourced Neighborhoods had similar effect sizes to ICS….

Table 3. Changes in Proportion of Exacerbations and Number of Maximum Symptom Days Before and After Move Among 123 MAP Participants

	Before move		After move							
Asthma outcome[a]	No. of visits	Mean (SD)	No. of visits	Mean (SD)	Unadjusted difference (95% CI)[b]	*P* value	Adjusted difference (95% CI)[b]	*P* value	Adjusted OR (95% CI)[c]	*P* value
At least 1 exacerbation in past 3 mo	305	0.15 (0.36)	422	0.09 (0.28)	−0.06 (−0.12 to −0.01)	.01	−0.07 (−0.12 to −0.02)	.009	0.46 (0.28 to 0.76)	.003
Maximum symptom days in past 14 d	306	5.05 (5.0)	425	2.68 (3.8)	−2.37 (−3.14 to −1.60)	<.001	−2.37 (−3.14 to −1.59)	<.001	0.41 (0.32 to 0.53)	<.001

- >50% reduced odds of asthma exacerbation and maximum asthma symptom days
- **Up to 1/3 of the effect size related to improvements in psychosocial stress, social cohesion, daytime/nighttime safety, urban stress**

Housing Reparations as an Avenue to Counter the Impact of Structural Racism on Asthma

Neeta Thakur, MD, MPH; Adali Martinez, MD, MPH

Table. Key Questions for Assessing Interventions Designed to Address Structural Racism

Component	Evaluation questions
Name and describe how racism is operating	
Name racism	Is racism explicitly named in the background or design of the intervention?
Role of racism	Is the mechanism or pathway by which racism is operating clearly delineated by the intervention?
Address racism	
Targets and works with a racialized group	Is the intervention designed for a specific racialized population? What is the involvement of the target community in the design of the intervention?
Intervention targets are policies, systems, or environments	At what level does the intervention target its effect? Does it require individuals to change their behavior?
Sustainable	What processes or funding are in place to ensure the intervention continues after the study if found to be effective?
Reparations	Does the intervention shift resources, power, and/or opportunities to the community?

Adapted from the works of Jones[11] and Malawa et al.[12]

JAMA Pediatrics | Original Investigation

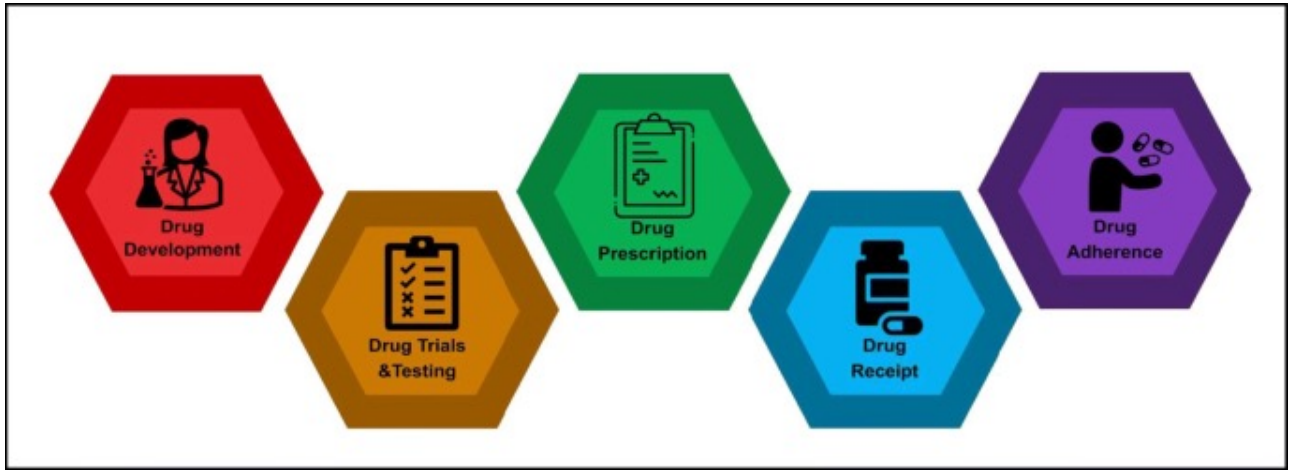
Social Risk Interventions and Health Care Utilization for Pediatric Asthma
A Systematic Review and Meta-analysis Feb 2022

Jordan Tyris, MD; Susan Keller, MLS, MS-HIT; Kavita Parikh, MD, MSHS

- Meta analysis of asthma interventions targeting SDOH (5 domains: economy, education, community, health, environment)
- Assess association with asthma-related healthcare utilization – ED visits and admissions
- 19 studies included >5000 participants
- Existing interventions addressed health, community, and environment domains
- **NO interventions targeting economic or education domains**

Pharmacoequity

- Individuals should have access to high-quality medications regardless of race/ethnicity, socioeconomic status, or availability of resources



Essien, JAMA 2021
Essien, JGIM 2022
Maldonado-Puebla, JACI:IP 2024

Strategies to improve access to therapeutics in the U.S.

Pharmacoequity in Allergy-Immunology: Disparities in Access to Medications for Allergic Diseases and Proposed Solutions in the United States and Globally

Martin Maldonado-Puebla, MD • Ayobami Akenroye, MBCHB, MPH, PhD • John Busby, PhD • Juan Carlos Cardet, MD, MPH • Margee Louisias, MD, MPH

- Role of perceived or actual patient self-advocacy?
- Role of interpersonal racism between clinician / system and patient ?

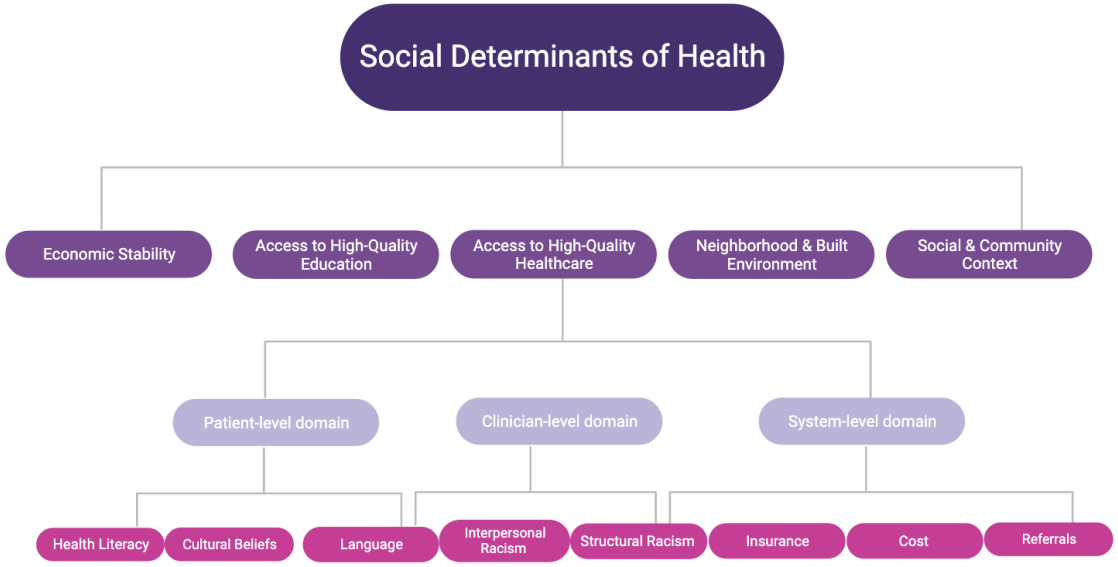


TABLE I. Strategies to improve access, by domain in United States

Access domain	Issue	Strategy
Insurance	Coverage gap	Encourage Medicaid Expansion
Insurance	Specialist access	Promote legislation supporting telemedicine
Insurance	Prior authorization	Encourage payers to streamline prior authorization process
Cost	Adherence and cost-effectiveness	Ensuring insurance coverage is consistent with most up-to-date disease specific guidelines (eg, SMART)
Cost	Decrease out-of-pocket medication costs	Promote generics and limit patent laws on brand name drugs
Referrals	Lack of knowledge of indications for referral	Primary care physician education
Patient- and clinician-levels	Language	Having on-site interpreters vs remote interpreter services. Having educational handouts in common languages
Patient-level	Cultural beliefs	Community health fairs highlighting allergic and immune conditions Increasing recruitment of historically minoritized groups in medical research
Clinician-level	Implicit bias	Incorporating implicit bias training in medical school, graduate medical education, and continuing education curricula. Increasing historically minoritized group recruitment into physician workforce and investigator positions

SMART, single maintenance and reliever therapy.

Conclusions

Black and Latinx communities have higher prevalence, morbidity, and mortality due to asthma

Asthma racial disparities is due to negatively impacted social determinants which are shaped by forces such as systemic racism & political systems

Interventions targeting SDOH are a critical way to reduce disparities in Black & Latinx patients (*as effective as medications & cross-cutting)

Black and Latinx patients are less likely to start biologics for asthma despite being sicker

Thank you

"We find the resources for what we value. We find the resources for what we truly care about."
Kedar Mate, CEO of Institute for Healthcare Improvement

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Simon, A et al (2017). *Academic pediatrics.*
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